

## CHAPTER 5 TIMING ADJUSTMENTS

### A. OLD STYLE MAGNETOS AND IGNITERS

The basic adjustment to be made first establishes proper timing between magneto and igniter units. It is critical, for as was discussed in the chapter on physics, a maximum voltage impulse from the magneto must occur at the precise moment that the electrode points open in the igniter to obtain an adequate spark at the points. Once the adjustment is correct, it must be verified periodically, and redone when necessary, for wear of component parts will inevitably change it. This adjustment is very easy and can best be made before the M-I unit is bolted to the engine. Proceed as follows: Simply check to be sure the end of the electrode arm adjusting screw L is just touching the tail of the push finger J while the igniter points are closed. If it does not, loosen the lock nut M on the adjusting screw and turn the screw in or out with a screwdriver until adjustment is precise. Then retighten the lock nut. See figure H and plate 6.

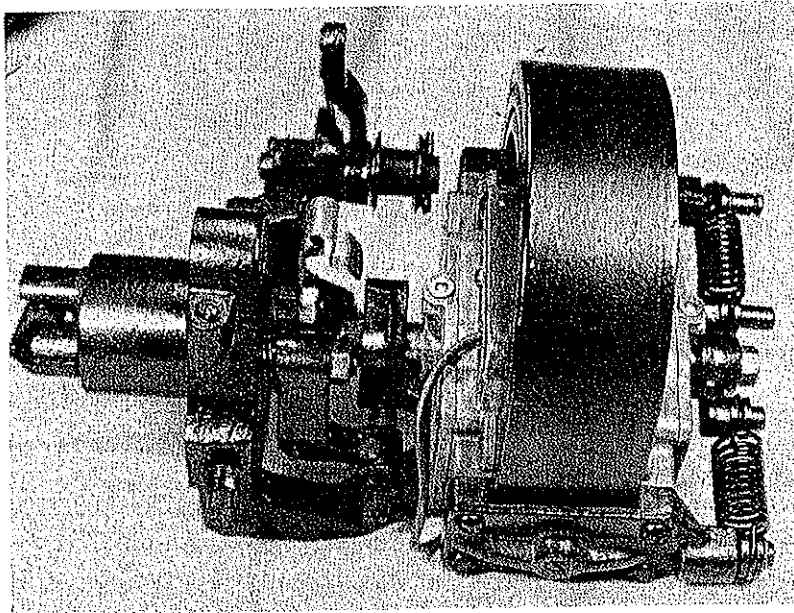


Plate 6  
Vertical view of old style  
L size M-I  
Shows the actual relationship  
between the tail of the push  
finger and the electrode arm  
screw.

OLD STYLE TRIP MECHANISM AND ITS RELATIONSHIP TO THE CORRESPONDING  
 PUSH FINGER AND ELECTRODE ARM ASSEMBLY OF THE MAGNETO-IGNITER UNIT

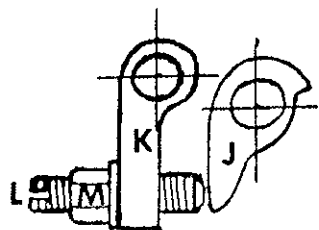


Figure H  
 Push finger J at rest

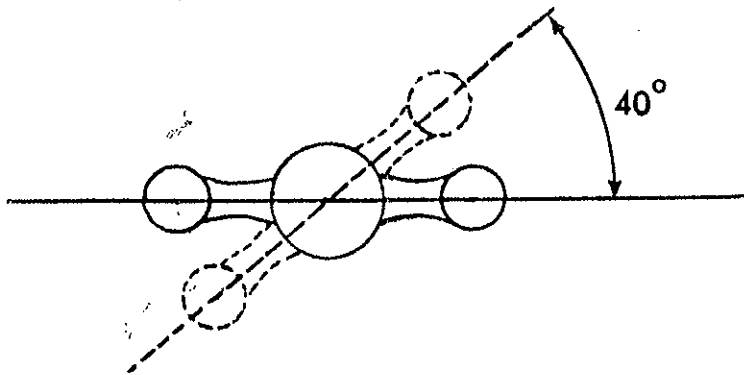


Figure I  
 Spring arm at rest and cocked to 40°

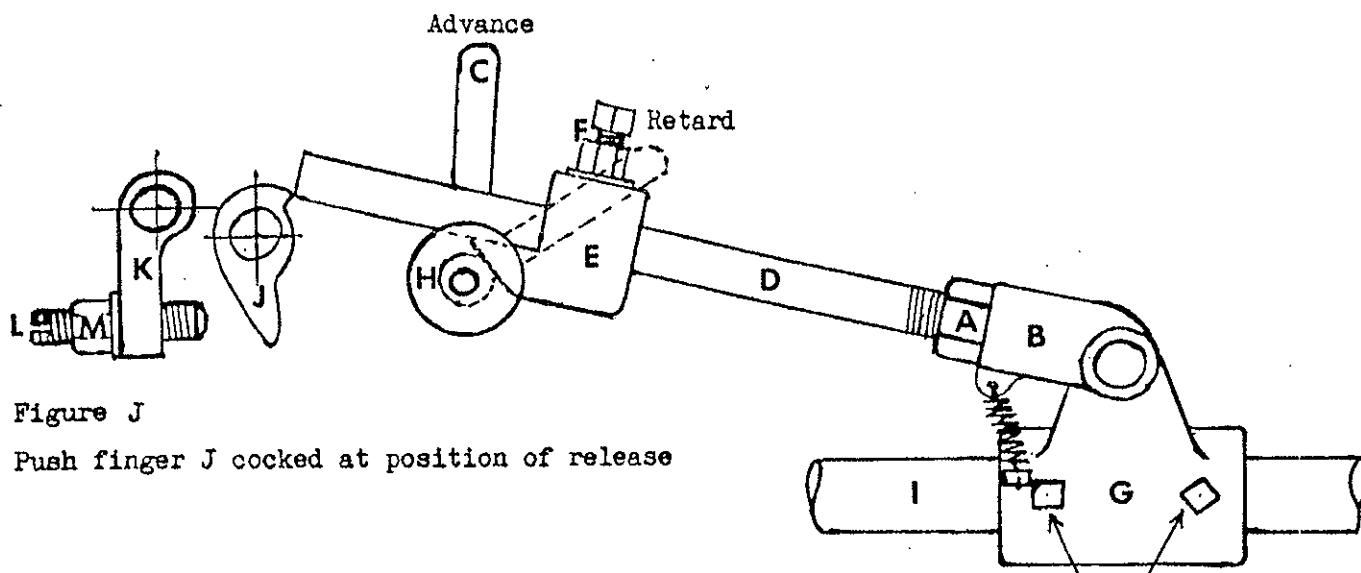


Figure J  
 Push finger J cocked at position of release

Valve rod clamp locking screws  
 (individual locations vary)

- |                      |                                 |
|----------------------|---------------------------------|
| A. Push rod lock nut | H. Push rod roller              |
| B. Push rod journal  | I. Valve rod                    |
| C. Timing lever      | J. Push finger                  |
| D. Push rod          | K. Electrode arm                |
| E. Wedge             | L. Electrode arm screw          |
| F. Wedge set screw   | M. Electrode arm screw lock nut |
| G. Valve rod clamp   |                                 |

The next set of adjustments must be done with the M-I unit firmly bolted to the engine in proper position. All diagrams and descriptions apply to a right-hand magneto setup as the majority of engines are so arranged. For proper orientation, "right" refers to the appropriate side of a horizontal engine cylinder while facing the cylinder head. See figure J.

Be sure the timer lever is in full advance or running position before these adjustments are made. Note: Some igniter units for small engines do not have a movable timer lever. The Alamo Blue Line 1-1/2 H. P. engine is an example. Here timing should be set only for full advance.

On a right-hand Webster magneto setup, the timer lever C, when in full advance position, is upright or as far towards the front of the cylinder head as possible.

The magneto push rod D or pawl should lie freely in the center of the push rod roller groove H without bind on either side. If a bind does exist, correct it by shifting spacer washers on one side of the push rod journal or even of the push rod roller.

The following final adjustments actually accomplish two objectives: cocking the magneto spring arm to the proper degree and releasing it at the proper time for ignition.

At this point it should be mentioned that originally the magneto starting handle provided a guide to the proper degree of cocking of the spring arm. See chapter, The Starting Handle. Very, very few engines, however, seem to be so equipped. With this in mind, it is suggested that deflection of the spring arm during cocking be as close as possible to about 40°, measured from the horizontal. See figure I. Now turn the engine crankshaft to the firing position. This means approximately 8°

spark advance for every 100 r.p.m. of engine speed. For a 300 r.p.m. horizontal engine, therefore, set the crank at  $24^{\circ}$  below inner dead center on compression stroke. With the crank still in this position, slide the valve rod clamp-push rod assembly on the exhaust rod until the tip of the push rod is about  $3/16$ " short of the center line of the magneto inductor shaft. The wedge locking screw should be loose and wedge E slid back on the push rod towards the journal B. Now tighten the valve rod clamp locking screws. See figure J. The purpose of the push rod is to cock the magneto by pressing against the push finger J and the wedge forces the tip of the push rod vertically to release the push finger. Now mark the position of the crank by making a chalk index mark on one flywheel with reference to the exhaust rod. Next slide the wedge forward on the push rod until the front of the wedge is just into the roller and tighten the wedge set screw F. The tip of the push rod should be resting on top of the push finger. Turn flywheel slowly backwards counterclockwise or against normal running direction until the push rod drops into the push rod roller. Then turn flywheel slowly forward towards firing position again. If everything is adjusted correctly, the magneto spring arm will rotate or cock to the desired  $40^{\circ}$  and the finger will be tripped in correct time with the chalk index mark on the flywheel. If the magneto cocking angle is not quite correct, readjust the push rod in or out slightly to correct it. To do so, loosen lock nut A, raise push rod out of the push rod roller groove, and rotate the push rod in the proper direction to make the necessary change. Then retighten lock nut.

To make the engine fire earlier, move the wedge slightly toward the magneto. To make it fire later, reverse the direction.